

STANFORD RESEARCH INSTITUTE

To:

J. Lederberg

Date:

2/24/61

From:

J. R. Mayo

Location:

Subject:

Answering:

Your tracer method of finding cyclohexane tricarboxylic acid is a sound one, but my & main interest is in getting enough cyclic trimer so that a sensitive analysis is not needed. It looks as if my radiation experiments are stalled for a few weeks for lack of assistance.

As for your questions about methane ice in comets and their polymerization, I am no authority on these matters, but I will do the best I can. The vapor pressure of methane is 1 mm. of Hg at 67.3° , 10 mm. at 77.7° K. Your moon isn't big enough to hold an atmosphere, I don't see how a comet can. Even at $10-50^\circ$ K, I would expect a comet to lose methane in outer space. If it is close enough to ~~receive~~^{absorb} much solar radiation, its temperature is inevitably much higher.

~~The~~ ^{From the} fact that comets are composed mainly of frozen methane ice, it follows immediately that the polymerization of methane must be inefficient or there wouldn't be so much methane there. I think that methane is ~~at~~ ^{about} the only alkane which is thermodynamically ~~stable~~ most stable. While steady radiation might shift the "equilibrium" slightly toward higher alkanes, it will also prevent them from accumulating.

In summary, I am very dubious about getting much higher alkanes from methane in comets, but I leave it to you as I have good my reasons are

MAYO, J. R.